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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 900251026

[REDACTED] EXAMINER

ARMSTRONG, ANGELA A

ART UNIT	PAPER NUMBER
2654	22

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/134,272	WANG, ZIFEI PETER
	Examiner Angela A. Armstrong	Art Unit 2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 06 March 2003.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 4-6,9,11,12,15-17 and 22-37 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 4-6,9,11,12,15-17 and 22-37 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) Interview Summary (PTO-413) Paper No(s) _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 06, 2003 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims **4, 6, 9, 11-12, 15-17, 22-23, and 25-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Polcyn et al.* (US Patent No. 5,311,588) in view of *Modi et al.* (US Patent No. 6,125,345) in further view of *Nicholls et al* (US Patent No. 6,223,154).
4. Regarding claims **4, 6, 9, 11-12, 15-17, 22-23, and 25-37**, *Polcyn et al.* discloses a method and system for determining the progress of a calling connection by determining signal transitions from tone to silence, silence to speech, etc. In the Abstract, at col. 1, lines 59-66 continuing to col. 2, lines 1-33, col. 7, lines 49-67 continuing to col. 8, lines 1-25, col. 16,

lines 20-37, and col. 16, lines 49-62 *Polcyn et al.* suggests/teaches a method of calculating a first ratio level of said audio signals and an average power level of signals (determining a peak-to-mean ratio) and comparing...ratio levels to a set of criteria to determine the line status (comparing the peak-to-mean ratio to a selected threshold to determine whether a frame represents a voice signal). At col. 2, lines 21-22 *Polcyn et al* teach that an essential feature of the invention is determining the difference between noise and a voice.

Polcyn et al. does not disclose that the ratios used in the detection method are normalized. However, refer to *Modi et al* who teach a system, which uses confidence measures for performing classification and verification. *Modi et al* teach confidence measures of likelihood scores and likelihood ratios at col. 4, lines 15-16. At col. 9, lines 32-36, *Modi et al* teach normalizing the confidence scores based on their dynamic ranges. As such, the claimed normalization calculations using the maximum averaged minus minimum averaged peak-to-mean ratio for the current audio frame constitutes dynamic range normalization.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of *Polcyn et al* to normalize the peak-to-average ratios for the purpose of providing verification of the noise/voice determination as suggested by *Modi et al*.

The combination of Polcyn and Modi does not teach using short-term averaged energy, long-term averaged energy, etc., in the voice/speech detection process. However, refer to *Nicholls et al* who discloses a communication device capabilities which implements a voice activity detector for an audio communication system using PCM data which calculates average energy values of received frames and determines if the average value exceeds a threshold and compares a staggered average energy value to a current frame energy value (col. 3, lines 64-66; col. 5, line 45-

col. 6, line 65; col. 7, lines 8-36; col. 7, line 37-col. 8, line 10), for the purpose of deciding when received audio contains voice or other audio information of importance.

Therefore, to the extent that *Polcyn et al* and *Modi et al* do not implement short-term averaged energy, long-term averaged energy... in a voice/speech activity detection system, it would have been obvious to one of ordinary skill at the time of invention to modify the system of *Polcyn et al* and *Modi et al* to implement the averaged energy determinations and calculations for the purpose of providing an enhanced voice activity detection system for deciding when received audio contains voice or other audio information of importance, as taught by *Nicholls et*

5. Claims **5 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Polcyn et al*, in view of *Modi et al*, and *Nicholls* as applied to claims 6 and 22 above, and further in view of *Janiszewski et al.*, (US Patent No. 5,657,422).
6. Regarding claims **5 and 24**, “conducting weighted average,” it is noted that *neither Polcyn et al, Modi et al*, nor *Nicholls et al* disclose weighted averages. *Janiszewski* discloses a voice activity detection system that estimates energy and noise of a signal. Specifically at col. 6, lines 1-8 *Janiszewski* disclose using a smoothing constant in calculating signal estimates and setting the smoothing constant to provide for acceptable frame averaging.

Therefore, to the extent that neither *Polcyn et al*, *Modi et al*, nor *Nicholls et al* disclose weighted averaging, it would have been obvious to one of ordinary skill at the time of invention to modify the voice detection of system of *Polcyn et al*, *Modi et al*, and *Nicholls et al* to conduct

a weighted average by using a smoothing constant for the purpose of providing acceptable frame averaging as taught by *Janiszewski et al.*

Response to Arguments

7. Applicant's arguments filed March 6, 2003 have been fully considered but they are not persuasive.

Applicant argues Nicholls fails to describe or suggest a tiered evaluation of reviewing short-term and long-term averaged energies prior to the determination of the peak-to-mean likelihood ratio, as set forth in claims 6, 12, and 22. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this instance, Nicholls is cited as teaching a voice activity detector for an audio communication system using PCM data which calculates average energy values of received frames and determines if the average value exceeds a threshold and compares a staggered average energy value to a current frame energy value, for the purpose of deciding when received audio contains voice or other audio information of importance. Polcyn was cited as teaching the calculation of peak-to-average ratios such that determined likelihood ratios are compared to a predetermined threshold to determine signal transitions from tones to silence, silence to speech, etc. Further, Modi was cited as teaching determining confidence measures of likelihood scores and likelihood ratios are determined such that the scores are normalized based

on their dynamic ranges (which reads on “the difference between the maximum averaged peak-to-mean ratio and the minimum averaged peak-to-mean ratio).

Therefore, the combination of Nicholls, Polcyn and Modi would provide for a voice activity detector for an audio communication system using PCM data which calculates average energy values of received frames and determines if the average value exceeds a threshold and compares a staggered average energy value to a current frame energy value (as provided by Nicholls), and further providing for the calculation of peak-to-average ratios (as provided by Polcyn), wherein confidence measures of likelihood scores and likelihood ratios are determined such that the scores are normalized based on their dynamic ranges (which reads on “the difference between the maximum averaged peak-to-mean ratio and the minimum averaged peak-to-mean ratio), as suggested by Modi, and the determined likelihood ratios are compared to a predetermined threshold to determine signal transitions from tones to silence, silence to speech, etc. (as suggested by Polcyn).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Angela A. Armstrong
Examiner
Art Unit 2654

AAA
May 18, 2003

Marsa D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600